american bonanza society newsletter

march, 1982 volume 82, no. 3 page 1153

BONANZA OF THE MONTH

This month our outstanding Bonanza is owned by the people who at one time have had all the Bonanzas of the Month — the Beech Factory. This month they are introducing the latest version of the turbocharged Model 36, the B36TC.

Beech has made some impressive changes in this airplane. First of all, they have increased the wing span 4'4", to 37'10". This wing span increase coupled with the use of the Model 58 Baron wing spar and carry-thru section allows for a gross weight increase of 200 lbs, to 3,850 lbs and an increase in useful load of 140 lbs, to 1,528 lbs. Pilot reports indicate that the longer wing improves both slow flight and stall characteristics. Vortex generators have been added to the leading edge of the wing to comply with FAA spin recovery requirements.

In addition the useable fuel capacity has been increased by 28 gallons, to 102 gallons. This is done by going to a system of two interconnecting bladders in the leading edge, similar to that used in several models of the Baron. Unfortunately, this installation precludes the use of in-the-wing radar; so Ryan Storm Scopes will be a popular option, and somebody will probably STC a Pod antenna.

With full fuel there is a payload capacity of over 900 lbs. At economy cruise the B-36TC has a range of 1,124 nautical miles (1,293 statue miles) with IFR reserves. Maximum speed is 213 knots; rate-of-climb is 1,049' per minute, with a service ceiling above 25,000'.

List base price is $151,350; but when all the goodies are put in, most will probably roll out the door at $200,000, plus.

All-in-all, the top-of-the-line Bonanza is *QUITE IMPRESSIVE*.

BONANZA SERVICE CLINIC SCHEDULE

THE 1982 SCHEDULE FOR THE BONANZA SERVICE CLINICS HAS BEEN SET UP:

Baton Rouge, Louisiana —
March 26 - 29, 1982
Bakersfield, California —
April 16 - 19, 1982
Jacksonville, Florida —
May 14 - 18, 1982
Colorado Springs, Colorado —
June 4 - 8, 1982
Oshkosh, Wisconsin —
June 25 - 29, 1982
Woodland, California —
July 23 - 26, 1982
Bedford, Massachusetts —
September 17 - 20, 1982
Oneonta, New York —
September 22 - 24, 1982

This extremely popular program is conducted by Norm Colvin, retired Bonanza Service Engineer for Beech, and now ABS Technical Consultant. Mr. Colvin inspects the owner's airplane and gives him a report as to general condition and special areas that might need attention. All owners are encouraged to be with Norm during the clinic, as it is quite educational. Cost of the clinic is $60.

Registration forms for both the Refresher Seminar or the Service Clinic can be found in this issue's Ad-Mart.

1982 BONANZA REFRESHER SEMINAR

The Bonanza Refresher Seminar, a ground school program designed to help Bonanza pilots and instructors in safety and efficiency, has established its 1982 schedule. It is as follows:

Denver, Colorado —
March 27 - 28, 1982
San Jose, California —
April 17 - 18, 1982
Costa Mesa, California —
April 24 - 25, 1982
Fort Lauderdale, Florida —
May 15 - 16, 1982
Tampa, Florida —
May 22 - 23, 1982
Portland, Oregon —
June 26 - 27, 1982
Dallas, Texas —
September 25 - 26, 1982
San Diego, California —
October 2 - 3, 1982
Washington, DC —
November 13 - 14, 1982
Detroit, Michigan —
November 20 - 21, 1982

Cost of the program is $75 and includes all materials.

1982 CHAPTER CALENDAR

SOUTHEAST CHAPTER

March 12 thru March 14 — Cypress Gardens, Florida

May 14 thru May 16 — Jacksonville/St. Augustine, Florida (coincides with ABS Service Clinic)

CONTACT: CHARLIE GIBBS, PO Box 10363, Jacksonville, Florida 32207, 904/398-2002

NORTH CENTRAL CHAPTER

May 21 thru May 22 — Barkley Lake Lodge, Kentucky

June 25 thru June 27 — Oshkosh, Wisconsin (coincides with ABS Service Clinic, also EAA Museum Tour

October 1 thru October 3 — Boyne Highlands, Michigan, day trip to Mackinac Island

CONTACT: DAVE MICHAELS, 23601 Outwood Drive, Southfield, Michigan 48034, 313/356-4326

NORTHEAST CHAPTER

No events planned

WESTERN CHAPTER

April 21 thru April 25 — Buchanan Field, Concord, California

September (date to be announced) — Portland, Oregon

CONTACT: ALDEN BARRIOS, 1436 Muirlands Drive, LaJolla, California 92037, 714/459-5901

SOUTHWEST CHAPTER

March 26 thru March 28 — Baton Rouge, Louisiana Fly-In (coincides with ABS Service Clinic)

June 13 thru June 20 — Canadian Trip, Montreal, Quebec, Ottawa and other points of interest

CONTACT: BILL MURMER, 7405 Airport Boulevard, Houston, Texas 77061, 713/643-2697

ROCKY MOUNTAIN CHAPTER

Last week in March — Caribbean Air Tour

June 4 thru June 6 — Colorado Springs Fly-In (coincides with ABS Service Clinic

CONTACT: LEE LARSON, 10458 Pearl Way, Northglenn, Colorado 80233, 303/452-8479

CRACKED "HEAVY" CASES?

There have been reports and an article in *Aviation Consumer* concerning cracking problems with the fourth generation, so called "heavy" case on the IO520.

Any member who has had a crack develop on a "heavy" case is asked to drop ABS a note.

LOGO CONTEST

The ABS is looking for an "official" logo to be used on the Newsletter, the building, stationary, patches, decals, etc. The Executive Director has about broken down trying to figure a design that has all three Bonanzas in it — 33, 35, 36. Now, the members can have their chance.

For inspiration the new Rocky Mountain Chapter logo is displayed below. Use it for inspiration, but please don't copy — originality counts.

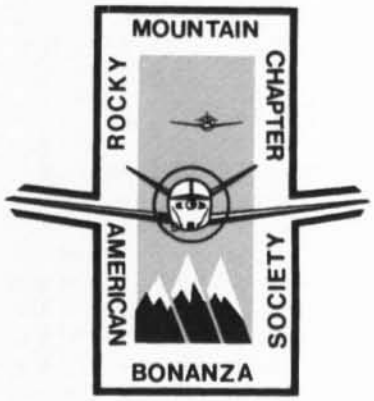
The rules are simple:

1) Entries can be hand drawn or in any other form that conveys the idea.

2) In case of similar designs, earliest postmark decides.

3) All entries must be submitted to ABS headquarters by May 31, 1982.

The ABS will select the five best entries and submit them to the Board of Directors for a vote. The winner will receive a FREE BONANZA . . . desk model (value $150).



WINSLOW FILTERS

Does any member know a source for filter elements for Winslow Oil Filter Systems? If so please let ABS Headquarters know.

ACCIDENT REPORTS

The pilot was killed when a Beech Baron, N10VS, crashed Jan. 3 during an instrument approach to Pinehurst, N.C. The plane missed the first approach and crashed on the second. The wreckage was located six miles south of Carthage, N.C. The flight had originated in Fulton County, Georgia.

SELECTOR VALVE ACCESS DOOR

Want to put a wing-type fastener on the selector valve access door or replace one that has fallen out? Clay Collier, ABS #4496, sends along the following part numbers you'll need:

1) WL-98293-1-060 Wing Stud

2) 130177-2 Pin

ABS ATIS

This should be an especially interesting edition of the ABS Newsletter with Beech announcing a new model Bonanza, the B36TC, and the first installment of the series on tip tanks. If well received, we will continue with this type of in-depth article. The response from members with information to contribute has been excellent, and I thank all of you who took the time to write or call.

I hope everyone had a chance to read the article on Bonanzas that appeared in the March issue of *FLYING*. Dick Collins spoke very highly of the Society and, in particular, raved about Norm Colvin. It is heartening to see Norm get the recognition in the media he so richly deserves. Norm's knowledge and dedication are tremendous assets to the Society and its members.

Members seem to like the new format of the Newsletter. We are still trying to come up with a masthead design that includes the Model 33. So far, nothing looks right; any suggestions would be appreciated.

The saying goes that "in the spring a young man's fancy turns towards romance"; well, in the spring around the ABS office our fancy turns towards the ABS Convention. The April issue will have the official announcement of our annual Convention in Orlando, Florida, August 18 thru August 22, 1982. But, let me throw in one little teaser right now. Your Associate Director, Jim Stargel, has arranged for members who are interested in getting their seaplane rating to do so at a very attractive price. With all the other programs that are being planned, this will be a Convention you won't want to miss!

Lets all of us be careful up there.

John Frank, Jr.
Executive Director

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Colvin's Corner

J. Norman Colvin
Retired Beech Project Engineer on Bonanzas and Barons
ABS Technical Consultant
Service Clinic Inspector

FUEL LINE HELP?

Dear Norm:

Recently I had a gas leak on the feed line from the left main tank. The leak apparently was limited to the nipple-clamp area and by rotating the clamp was able to stop the leak, only temporarily I am afraid. I need advice.

1) Can you send me a step-by-step procedure to remove the bladder?

2) Will crunching it through the filler opening cause cracks, failure, etc.?

3) Can the unit be repaired? If so where?

4) Can the underside of the wing compartment be drilled out to allow the bladder to be dropped without forcing severe bends, etc.? It "appears" that a metal panel can be removed by drilling out rivets and if so replacement should be "simple".)

I'd appreciate your early response, I need advice now!

Gordan Cauley
ABS #8298

Dear Mr. Cauley:

This is in reply to your letter and our recent telephone conversation regarding the 20-gallon fuel cells in your Bonanza.

Since the fuel leak was in the fuel feed line nipple, it would be best to remove the cell for inspection.

To remove the cell, disconnect the main fuel line at the cell-root end. Disconnect the fuel vent line at the outboard end. Access is gained through an access panel on the lower side of the wing. Remove the access panel on the top wing. Disconnect the fuel transmitter wires and remove the fuel transmitter. The tank is attached to the cell top by bayonet-type fasteners. Simply pull the fasteners loose. Remove the tank. It can be rolled or bunched to remove. If the tank is to remain empty for a period of time, coat the inside surface with a light coat of engine oil to preserve the rubber.

Don't drill out any rivets. There is a metal liner surrounding the tank, so remove it through the opening provided.

If you need more help, let me know.

NEEDS FABRIC AILERONS AND FLAPS

Roy Good of Aircraft & Engine Enterprises, Inc., PO Box 607, Moore, Oklahoma 73160, 405/794-4417, is rebuilding D-4 the fourth production Bonanza. He needs a set of fabric-covered ailerons and ruddervators. Anyone who knows where a set of these surfaces can be obtained, or even some pieces from which Roy can build up the surfaces, should give him a call. He'll buy, trade or what-have-you.

CRANKING INBOARD DOORS IS A NO-NO!

Dear ABS:

I believe the following will be of interest to all Bonanza, Debonair and Big Bonanza (A-36) owners.

I recently had our A-36 in to a reputable shop for a minor service (oil change, filter), and inspection of the landing flap angle transmitter; and the "alledged" mechanic, in seeking access to the transmitter in the left wheel well under the inboard wheel cover, cranked the emergency gear handle to open the inboard wheel well doors without placing the plane on jacks or having an observer on the outside, cranked the emergency gear handle far enough to retract the nose wheel, which of course, caused the nose of the plane to drop slowly — causing five thousand dollars worth of cosmetic damage to the front underside of the craft, and putting it out of service for two months.

The original problem with the flap transmitter was such that the indicator read either full up or full down, and I was assured prior to any work that the repair was simple.

I understand now that what I experienced is a common occurrence, i.e. wheel well doors are opened without the plane on jacks by use of the emergency gear handle and often with same resultant damage.

Your comments in the Newsletter with respect to this procedure and ramifications to the total gear mechanism as well as warning to others will be appreciated. It is interesting to note that the mechanic when questioned by the Beech and insurance representatives was vehement in his expressions that the system was poorly designed. I was never able to learn if he was a licensed mechanic, although I know the shop was properly licensed.

Keep up the good work.

ANONYMOUS

This subject has been brought up several times in the Newsletter, but let's emphasis this one more time. THE INBOARD GEAR DOORS CANNOT BE CRANKED DOWN ON THE GROUND WITHOUT COLLAPSING THE NOSE LANDING GEAR.

If you wish to open the inboard doors on the ground without jacking the airplane you can remove the front seats, open the access panels to the landing gear box and disconnect the doors at their actuator rods. You may have to turn the landing gear hand crank a bit to take some of the tension off the rods, but no more than 1/2 turn.

We thank our anonymous member for sharing his painful experience.

TACH CHECK

Dear Norm:

Much good advice has been published on the matter of tachometer accuracy and checking. There is, however, one very simple and accurate means of checking which I have not seen in print, or if previously published would bear repeating.

On those aircraft with a recording tachometer, be aware that although the tachometer may not be accurate, the hour-meter portion being directly geared through mechanical linkage to the engine crankshaft is not subject to any inaccuracy, other than complete failure of the gear train. The gearing is such that hours, tenths and hundredths are correctly registered at one specific RPM. That is the hour-meter design speed and is normally printed on the back of the tachometer case. On the straight 35 Bonanza, with which I am most familiar, that speed is 2053 RPM.

Even though the hour-meter may indicate nothing smaller than 1/10th hour, the drum to the right is indicating 1/100ths, by means of alternate black and white squares. Now 1/100ths, of an hour is 36 seconds. So: Cruise your airplane at some constant indicated RPM and carefully check the number of seconds required to register either 1/100th or 1/10th on the hour-meter. Use the formula:

$$\frac{\text{BASIC RPM} \times 36 \text{ (or } 360)}{\text{OBSERVED SECONDS}} = \text{ACTUAL RPM}$$

Compare this figure with INDICATED RPM. BASIC RPM is the design RPM of the hour-meter, 2053 in the case of the Model 35 Bonanza.

Norm, I always enjoy your column. Keep up the good work. I have owned and flown the same Model 35, 4560V, continuously for twenty-six years. Is there any one out there that can equal or beat that record?

Lewis C. Criley
ABS #3497

Dear Mr. Criley,

Thank you for your letter in which you included a formula for checking tachometer accuracy. This is valuable information that can be used by other ABS Members.

WATER IN AILERONS

Dear Dr. Young,

Thank you for your letter in which you talked about water in the ailerons on your model A36 Bonanza.

Water is most likely entering the aileron through the hinge cut-out. While you may not be able to eliminate the water entirely, it can be reduced by sealing the relief holes in the small ribs that seal off the hinge opening. A drain hole should be drilled at the aileron inboard end, just forward of the aileron spar, of course, on the underneath side. A number 30 drill-size hole will be sufficient. The inboard aileron rib has a relief cut-out at the trailing-edge end so no hole is required in the lower skin at that position.

I trust that the above information will serve your needs. Thank you for the opportunity to be of service.

SOUND PROOFING MATERIAL

Dear Norm:

Good job — Colvin's Corner is a must reading for me.

I am restoring a Model 35 ('47) and found it necessary to remove the old tar sound deadener from the bottom of the cabin. Can you advise:

1) Should I chromate and leave bare?
2) Chromate and add under coat to deaden sound?
3) Add under coat without chromate?
4) Just chromate, as under coat does not add much to noise quieting in the Beech.

I find under the floor boards is an excellent place to trap engine oil — which of course softens the undercoat.

Do you have a recommendation?

Thank you.

W.J. McCreary
ABS #14655

Dear Mr. McCreary:

Thank you for your letter and for the good news that you are restoring serial #47 Bonanza.

Since the belly skins are alclad aluminum, I would simply clean away the old sound deadener and replace it with fresh undercoat material. This material does a good job and is about the only material that won't absorb oil.

If you are in need of parts, you might let me know.

ENGINE STORAGE

Dear Mr. Schiff:

This is in reply to your letter in which you asked for information on how to prepare an engine for storage.

Continental Service Bulletin M-81-3 Rev. 1 covers not only how to prepare an engine for storage, but what to do when the engine is taken out of storage. This is a relatively new bulletin but most service facilities should have a copy and, of course, you can obtain a copy by writing to Continental Motors in Mobile, Alabama. Their phone number is 205/438-3411.

TURNING BACK

Dear ABS:

One thing I would like to find out and haven't been able to is to determine what is the minimum 180° bank to the airport altitude with an engine failure? I've never had one, so I can't use any yardstick. Anybody have any ideas?

Wallace J. Balla,
ABS #2203

This question was passed on to a couple of Bonanza experts — Bob Buettgenbach at Beech, and Pete London, one of our seminar instructors. Here are their answers. Member comments are invited.

Dear ABS:

Reference your question: It's a tough one to answer because of so many factors that are involved — such as pilot proficiency, wind, weight, terrain and obstacles.

The comments I will make are definitely not company policy or recommendations. In an emergency the pilot-in-command has to make the final decision.

Under ideal conditions; light weight, no wind and able to make an unobstructed turn, I might try a 180° turn at as low as 600'; however, I would not suggest anything less than 1,000' to any one.

Recommendations are always straight ahead, but then that may not be the best either. This will give you something to hangar talk on.

Bob Buettgenbach,
Production Flight Test,
Beech Aircraft

Dear ABS:

Concerning the subject of turning back to the runway following an engine failure on takeoff, each pilot should determine the minimum altitude at which an attempt of such a maneuver would be made in a particular aircraft. Just what this minimum altitude is for the Bonanza is a question often asked by our members. Experimentation at a safe altitude (at least 3,000' AGL) should provide an approximation of height lost in a decending 180° turn at idle power. By adding a safety factor of 25 percent our members should arrive at a practical "decision height".

In my experience during demonstrated practice of this maneuver with Bonanza owner/operators I have found the altitude loss to range between 800' at 3,000 lb and 900' at 3,400 lbs. with gear and flaps retracted. This, of course, is dependent on Pilot technique in maintaining the specified glide speed and use of no more than a 30° bank. Therefore, the "decision height" for a Bonanza should be at least 1,000' at 3,000 lbs. and 1,125' at 3,400 lbs.; however, I recommend that our members practice this maneuver first, at a safe altitude, to determine their own specific airplane's altitude loss.

It speaks for itself that the ability to make a 180° turn does not necessarily mean that the departure runway can be reached in a power-off glide; this depends on the wind, the distance traveled during the climb, the height reached and the glide distance. It is critical, therefore, that the climb after takeoff be made at the best rate of climb airspeed with maximum continuous power to the "decision height".

Peter London

AUTOPILOT INFORMATION

SUGGESTIONS FOR SELECTING AN AUTOPILOT

Dear ABS:

In January, 1982, Dr. Warren C. Schilib asked in the ABS Newsletter, "Where can I get an unbiased comparison for autopilots for the S-35, and what comparison in cost are we talking about?" May I suggest a few guidelines for the owner of any Bonanza that will help answer this question.

It must be realized that autopilot manufacturers will certainly suggest their product as the best choice. The fact that a given manufacturer has obtained an STC for his system in a particular model Bonanza does not "automatically" mean that his is better for the owner than a competitive manufacturer's system, also STC'd for a Bonanza.

Often a fellow-Bonanza owner will remark that his experience with a particular type autopilot has been good, and many buying decisions are based on that kind of recommendation. In that case I recall my father-in-law's experience with a Nav-Comm (now out of production). This particular unit never missed a beat in the several years he owned his Bonanza. The whole picture, however, is not as pleasant. Actually, that unit enjoyed a reputation as a marginally-reliable piece of equipment and was soon dropped from production. I guess the moral here is that individual experiences — good or bad — with avionics systems are not necessarily true indicators of performance. There are also various national publications that attempt to determine reliability, serviceability and cost of maintenance of various avionic systems. I can only comment that seldom have these studies corresponded to my experience, and in some cases seem to have been less-than-scientific in their methods of determining their facts.

So, where does that leave Dr. Schilb and his legitimate question? I hope the following suggestions help:

1) The first consideration should be to determine how many axes you want the autopilot to control. Roll? Pitch and roll? Pitch, roll and yaw?

2) Next, determine the serviceability and reliability of the various systems that fit your requirements. The best source of that information is the avionics shop you do business with. If they are not equipped to service and install autopilots (an expensive investment in specialized test equipment and training), seek their recommendation of a shop that does. The avionics shop can provide this information because they are responsible for your ultimate satisfaction with your purchase. Avoid autopilots that require repair of components "only at the factory". Select, if you can, a system that offers a modular service concept, i.e., a pitch problem solved by replacing a pitch module without disturbing the properly-operating roll portion of the system — also reducing the labor costs in troubleshooting and repair. All systems have warranties. Ask what the warranty actually covers. Does it cover removal and replacement of a faulty component? Does it cover in-flight calibration and adjustments? If a part is needed for repair and must be shipped from the manufacturer, are shipping charges covered? Does the manufacturer offer "loaner" or "rental" units if your system must be removed for repair? Are these "loaners" or "rentals" offered after the warranty period expires (usually 12 months)? Your avionics shop manager can answer these questions, and he will. His business depends on your continued support. Product support is the important consideration here.

3) Avoid the unknown. No one is better equipped to accomplish a quick and trouble-free installation of an autopilot in a Bonanza than an avionics shop that has experience with the Bonanza.

4) Remember that Beech Aircraft has a vigorous on-going test program to determine the best avionics equipment to install in new Bonanzas. Find out from your local Beech dealer what Beech is offering in the current-model Bonanza. Those systems are chosen to enhance the owners utilization and enjoyment of ownership.

A few other points. Ask for a set of the installation drawings to carry in your aircraft when away from home in case you need service. Thoroughly familarize yourself with the operation of your new autopilot and practice flying it in all modes of operation.

Autopilots are not inexpensive — to be sure; but the reduction of pilot workload and enhancement they bring to the overall joy of flying your Bonanza make them well worth the investment.

I hope these ideas are of some assistance to Dr. Schilb and to you, John; best wishes and good luck.

Brad Carder

Editor's Note: Brad Carder is Avionics Manager at FLIGHTCRAFT, INC. in Portland, Oregon, and previously was an avionics instructor for the Beech factory. He is an expert on avionics installations in Bonanzas and other Beech products.

AUTOPILOT INFORMATION

Dear ABS:

In your January Newsletter there was some discussion about autopilots for Bonanzas. My P-35 had a Century II-B with a coupler, and it worked very well. Response in turbulence was good, and it would lock onto and track a VOR radial or localizer pretty well

I recently removed the II-B and replaced it with the full autopilot system offered by S-TEC Corporation in Mineral Wells, Texas. My new autopilot has a flight director and all of the features you would want in an autopilot. The S-TEC tracks very well and will keep the needles in the center on an ILS. With the altitude pre-select I can set in my cruising altitude and rate of climb. After takeoff I turn the autopilot on and it climbs at the selected rate and automatically levels off and trims at the selected altitude. I am very well satisfied with it.

I believe S-TEC offers the altitude-hold and pre-select as an add-on to the Century II-B. If anyone has any questions about this autopilot, I'll be happy to answer them if I can. Also, if someone needs a good Century II-B, I have one for sale.

Bill Brown,
ABS #9425

AUTOPILOT REPORTS

Dear ABS:

Dr. Warren C. Schilb asked for a comparison between the B-4 Autopilot and the Century III. I have flown both and would be pleased to comment and I hope my comments will be helpful. I flew an S-35 equipped with a B-4 Autopilot over 2000 hours and currently I am flying a V-35B with a Century III Autopilot. I have found both of these Autopilots to be quite satisfactory under all circumstances. The Century III is some what more sophisticated. I like one feature particularly about the B-4, and that is it continues to function as a wing leveler in event of total electric failure. I think that the B-4 works well in severe turbulence and never felt that it responded too slowly to be quite satisfactory under the most severe instrument conditions. I do not think that the Century III tracks as smoothly or as solidly as the B-4. I think that if I had the choice, as Dr. Schilb apparently has, I would choose the B-4.

I hope this will be of some help.

Gene L. Whitington,
ABS #3670

TIP TANKS — EXTRA GALLONS AT YOUR FINGER (AND WING) TIPS

The original Bonanzas had a total fuel capacity of 40 gallons in two 20-gallon fuel bladders in the leading edge of the wings. At first, 37 gallons was considered useable; but in the 1970s the FAA reduced the useable fuel to 34 gallons. This made the Bonanza rather short ranged, especially with IFR reserves. And, though Beech gradually increased the internal fuel capacity up to the present 80 gallons (102 gallons on the new B36TC), many owners and operators have looked for ways to increase the fuel capacity even further. The most common method is through the use of tip tanks.

GENERAL HISTORY

The story of tip tanks actually begins in the baggage compartment. Beech made available to owners of 35s thru E-35s an auxiliary fuel tank mounted in the baggage compartment. This tank came in two sizes — 10 gallons and 20 gallons. Depending on the installation, this tank was filled either through a small door on the left side of the fuselage or through the baggage compartment door. The fuel was routed to the auxiliary position on the fuel selector valve. There also was an STC issued to Symons Engineering Company, PO Box 90002, Airport Station, Los Angeles, California 90009, for a baggage compartment auxiliary tank. While this tank was placarded for 20 gallons of fuel, there was sufficient "fuel expansion" space to put in close to 30 gallons.

While all these tanks put extra fuel on board, they had several disadvantages. First of all, the weight of the fuel shifted the CG aft, an area the Bonanza was already sensitive to. Secondly, they took up space that could be used for baggage. There was also concern about having fuel within the fuselage and the possible fire hazard in case of an accident.

None of these tanks are currently manufactured, although occasionally a used tank will show up on the market. Many of the older Bonanzas still have them installed, and they have given good service for more than 30 years.

Beech was the first to put a set of tip tanks on a Bonanza, but these were not available to any customer. In 1949 the factory decided to go after a long-distance record to emphasize the reliability of the Bonanza. To accomplish this they built up two sets of tip tanks; each tank held 62 gallons of fuel. The first set of tanks, made of aluminim and with visible welded seams, were used by Capt. Bill Odom to fly Waikiki Beech from Honolulu to Oakland, California. Capt. Odom used the second set of tanks, also aluminum but with a seamless appearance, to fly the same plane from Honolulu to Teterboro, New Jersey. Waikiki Beech, a straight 35, pre-production number four, also had cabin fuel tanks installed holding 126 gallons.

The second seamless set of tip tanks were later used on the Philippine Bonanza, a J-35, by Capt. Pat Boling, to fly from Manila to Pendleton, Oregon in 1958. These tanks and the Philippine Bonanza were lost when Peter Gluckman disappeared attempting to fly from Tokyo to New York in 1960. Waikiki Beech, with the first Bonanza tip tanks installed, is presently displayed in the National Air and Space Museum in Washington, DC.

There has been one other "non-standard" tip tank installation of note. Frank Haile, Jr., ABS #93, took a couple of 230-gallon military drop tanks, cut out the center section, put the nose and stern together, and — VIOLA! — two 115-gallon tip tanks. Actually, due to filler-cap position, he could only put 95 gallons in each and never did put more than 85-gallons each. He used this installation for an around-the-world trip. Frank mentioned that the wing skins developed some wrinkles when the tips were full, and he was real careful to avoid bumps when taxiing. Everything worked out all right,

"Waikiki Beech" hangs in the Smithsonian with its 62-gallon tip tanks.

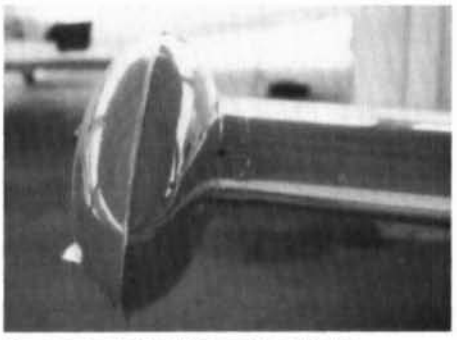
and the wrinkles went away when the tanks were empty. His airplane garnered the name "Bionic Bonanza".

FLIGHT EXTENDER HISTORY

In 1959 a company called the Flight Extender Company of Stamford, Connecticut obtained an STC and began to manufacture a 12-gallon tip tank for the Bonanza. These tanks were of welded aluminum construction with a vertical seam that ran around the tank. Some problems developed with these seams leaking, and in 1964 Flight Extender began to manufacture a fiberglass tank in a 15-gallon size. The first fiberglass tanks were vertical, but later a version was offered with a 30° canted appearance. All these tanks were certified for all the Bonanzas in production at that time, from the 35 on up. However, the paperwork on these tanks has been a problem, with some very inaccurate figures about CG, gross weight increases, etc. Apparently there are about eleven different versions of paperwork for the older tanks floating around. It appears that all but the original 35s were eventually allowed a 200 lbs. gross weight increase, all of which had to be in fuel. Mr. Bamber, who operated Flight Extenders, got fed up with the aviation business in the mid'60s and went down to Cat Island in the Bahamas to operate a resort. It is understood that he is there to this day.

While the Flight Extender Company went dormant in the mid '60s, Flight Extender tip tanks did not. A gentleman in Florida began to manufacture a fiberglass tip tank called a Flight Extender. The only problem was that he did not have the Flight Extender STC nor any other STC for tip tanks. The product he manufactured was of poor quality and had numerous problems. These bogus tanks were subject to cracks and venting difficulties, which is understandable as no vent system was installed. At least one inflight total failure (tank separated from the aircraft) occurred. In the early '70s, this fellow disappeared from the scene. However, there are more than a few Bonanzas being flown, either unknowingly or otherwise, with these bogus tanks. The absence of any manufacturer's plate, serial number, part numbers, etc. seems to be the best way of determining these bogus tanks. They were made out of boat resin and 10 oz. cloth with liquidometers of a different configuration than the real thing. They also utilized military surplus navigation lights. Beryl D'Shannon estimates that about 150 sets of bogus tanks were made.

In 1968 the Flight Extender STC was obtained by an R. B. Matheson of



An original 12-1/2 gallon Flight Extender tank. Note vertical seam.

Clayton, California. While he provided some technical data to owners of existing tanks, it is not believed that he actually produced any tanks himself.

In 1971 Alan Peterson of Beryl D'Shannon, Route 2, PO Box 272, Jordon, Minnesota 55352, obtained the Flight Extender STCs, and he still holds them. Beryl D'Shannon was already strongly associated with Bonanza modifications, producing air-oil separators, one-piece windshields and third window kits. In the years he has been making the Flight Extender tip tanks, Alan has brought about numerous changes. Alterations in shape, fuel routing, materials, gross weight allowances, etc. have generally improved the product to the point that while appearance is similar, there is very little else in common between Beryl D'Shannon's Flight Extenders and those tanks manufactured in the 1960s. One complaint Mr. Peterson has is that people who have problems with these older tip tanks tend to blame him when he actually had nothing to do with the Flight Extender' product until 1971. Although he has no legal or moral responsibility to do so, Alan does try to help these owners of the original tip tanks where he can.

Beryl D'Shannon presently manufactures tip tanks approved for ALL models of Bonanzas. These tanks hold 15-gallons each, are fiberglass, have a canted appearance, have flush-mounted NAV and strobe light positions and have a visual fuel indicator as well as gauges. An interesting option is Explosafe, an expanded aluminum material that occupies only one percent of the volume of the tank, but provides structural rigidity and absolute proof against explosion — certainly something to give thought to, especially with tip-mounted strobes.

Different gross weight increases are allowed, depending on model:

1) A-35 thru P-35 — 200-lbs. increase

2) 35-33 thru 35-B-33 — 50-lbs. increase

3) S-35, C-33A, E-33A, E-33C — 100-lbs. increase (see 4)

4) S-35, C-33A, E-33A, E-33C — 250-lbs. increase (with specific wheel, brake and tire assemblies)

5) V-35, V-35A, V-35B, F-33A, F-33C — 150-lbs. increase

These gross weight increases are for both takeoff and landing with no minimum tip fuel requirement. There is no gross weight increase for the straight 35 or any of the 36 Series. Alan Peterson says he is working on getting an increase for the 36. Costs for the tip tank kits are $2,995 or $3,395, with Explosafe. Beryl D'Shannon can also do the installation.

Beryl D'Shannon tanks on an A-36.

HISTORY — BRITTAIN

The history of the Brittain Tip Tank is much simpler than that of the Flight

Beryl D'Shannon tanks on a Bonanza. Note flush nav. lights.

Extenders. In 1960 Brittain Industries developed a tip tank system for the Bonanza, along with the Navion, Commanche and Twin Commanche. In 1969 it sold this STC to the Osborne Tank Company, Star Route, Box 12, Oro Grande, California 92568, telephone 714/254-2026, who are still producing the tanks today. The Brittain tank is a 20-gallon aluminum tank. It has been available as a factory-installed option on Vee-Tail and 33 Bonanzas since 1961. These tanks are approved for all Bonanzas except the original Model 35 and all of the 36 Series. The company is working on an STC approval for the 36 Series. Gross weight increases of between 100 to 200 lbs. are allowed depending on model with certain minimum tip fuel requirements. (See table below)

Recently, Osborne has given the tanks a more streamlined appearance and flush-mounted navigation lights. A kit to streamline the old tanks is now available. The present cost of the Brittain Tip Tank System is $3,177 to $3,530, depending on model Bonanza. A 10% discount is given to ABS members. Osborne estimates 24 — 30 man hours for installation, and they can to installations, if the customer desires.

(BRITTAIN) WING TIP TANK INFORMATION

MODEL	ORIG. AIRCRAFT GROSS WT.	MAX. ALLOWABLE GROSS WT. WITH TIP TANKS		KIT INSTALLATION WEIGHT (MOMENT ARM--90")	NET USEFUL LOAD WEIGHT INCREASE	MIN. FUEL REQ. IN EACH TIP TANK FOR TAKE-OFF AT MAX. GROSS WT.
		TAKE-OFF	LANDING			
A35, B35, R35 (185 hp.)	2650	2750	2650	+ 22 lbs.	+ 78 lbs.	No min. fuel req.
A35, B35, R35 (205 hp.)	2650	2800	2650	+ 22 lbs.	+ 128 lbs.	6 1/4 gal. each
C35	2700	2850	2700	+ 22 lbs.	+ 128 lbs.	6 1/4 gal. each
D35, E35	2725	2875	2725	+ 22 lbs.	+ 128 lbs.	6 1/4 gal. each
F35	2750	2900	2750	+ 22 lbs.	+ 128 lbs.	6 1/4 gal. each
G35	2775	2925	2775	+ 22 lbs.	+ 128 lbs.	6 1/4 gal. each
H35	2900	3050	2900	+ 22 lbs.	+ 128 lbs.	No min. fuel req.
J35	2900	3050	2900	+ 22 lbs.	+ 128 lbs.	6 1/4 gal. each
K35, M35	2950	3100	2950	+ 22 lbs.	+ 128 lbs.	6 1/4 gal. each
N35, P35	3125	3275	3125	+ 22 lbs.	+ 128 lbs.	No min. fuel req.
S35	3300	3500	3500	+ 24 lbs.	+ 176 lbs.	No min. fuel req.
V35, V35TC & later models	3400	3600	3600	+ 24 lbs.	+ 176 lbs.	2 gal. each tank
33	2900	3050	2900	+ 22 lbs.	+ 128 lbs.	6 1/4 gal. each
A33, B33	3000	3150	3090	+ 22 lbs.	+ 128 lbs.	6 1/4 gal. each
C33	3050	3150	3000	+ 22 lbs.	+ 78 lbs.	6 1/4 gal. each
C33A	3300	3500	3500	+ 24 lbs.	+ 176 lbs.	No min. fuel req.

THE FUTURE

There is a new type of tip tank that may appear some day. There is a firm in California that is working on an extended wing tip that will hold 17 gallons. They have presently applied for an STC.

However, caution is advised in anticipating this new product or waiting on either Beryl D'Shannon or Osborne for promised approvals or gross weight increases. At best, the FAA approves these things in a much, much longer period of time than the manufacturer predicts — and, at worst, it never gets approved at all. What is available now is all that can be counted on.

This, then, is the history of Bonanza tip tanks, along with a rundown of what is currently available.

In the April issue of your ABS Newsletter there will be an in-depth look at the methods of installation for the Brittain, Flight Extender and Beryl D'Shannon tip tanks, along with letters from members sharing their experiences with tip tanks.

Brittain tip tanks on a radar-equipped Bonanza.

The look of the future? Still a ways to go.

LANDING GEAR RIGGING

Dear ABS:

I'm writing this letter as an aid for mechanics and owners to properly check the landing gear system on a Bonanza during routine maintenance. The Bonanza service manual is not much help to the mechanic in setting up a step-by-step procedure to check gear limits during an annual or a hundred-hour inspection.

The procedure I use to check the gear is below. It works very well in getting everything checked in a minimum amount of time. If a particular clearance is out of limits, correct it before going to the next step. Use the Bonanza service manual to help you correct anything that is out of limits.

1) Disconnect outboard gear doors at main gear. Remove lefthand nose gear retract rod and tape the door

2) Retract gear — check for 1/8 to 1/4 turn from internal stop with gear extension handle.

3) Extend gear — check for 1/8 to 1/4 turn from internal stop with gear extension handle.

4) Retract gear — check nose gear-up tension (18 to 25 lb). Check main gear clearance between inboard gear door (1/4") and V-brace clearance from top wing skin (usually 1/16" to 1/8"). If either clearance needs adjustment, back off uplock striker and turn in V-brace stop bolt before adjusting.

5) Partially extend gear to 3/4 down — check for excessive movement of inboard gear doors (1" is too much). Using your hand, gently push the gears toward the retracted position to determine that the slip joints move freely. Gently move the nose gear back and forth to detect excessive wear in retract linkages.

6) Retract gear — check uplock striker clearance (1/64"). Adjust if necessary, then check uplock cable tension (52-1/2 lb + 10 lb — 0 lb). Check that the V-brace stop bolt is touching the main gear. Check inboard door tension (about 10 lb).

7) Extend gear — check downlock tensions (45 to 65 lb). Hook up all doors. Retract the gear and check doors.

NOTE:

The most common mistake I find when working on a particular airplane for the first time is that someone has adjusted the downlock tension by changing the position of the retract rod and rod-end bearing. *NEVER DO THIS!* The rod-end bearing — at the retract braces — determines the gear-up position and up tension (nose gear). Downlock tension is chenged by the addition or removal of the proper washers under the downlock springs. If the number of washers has to be changed on the main gear, *carefully* count the number of turns (I count by half-turns) it takes to remove the outboard rod-end bearing from the retract rod. Make sure it is returned to its original position after changing washers. As a check that the rod-end bearing is in the right position, retract the gear and check that the uplock clearance has not changed.

Daniel T. Towery II,
Towery Aircraft,
Cheswold, Delaware,
ABS #8133

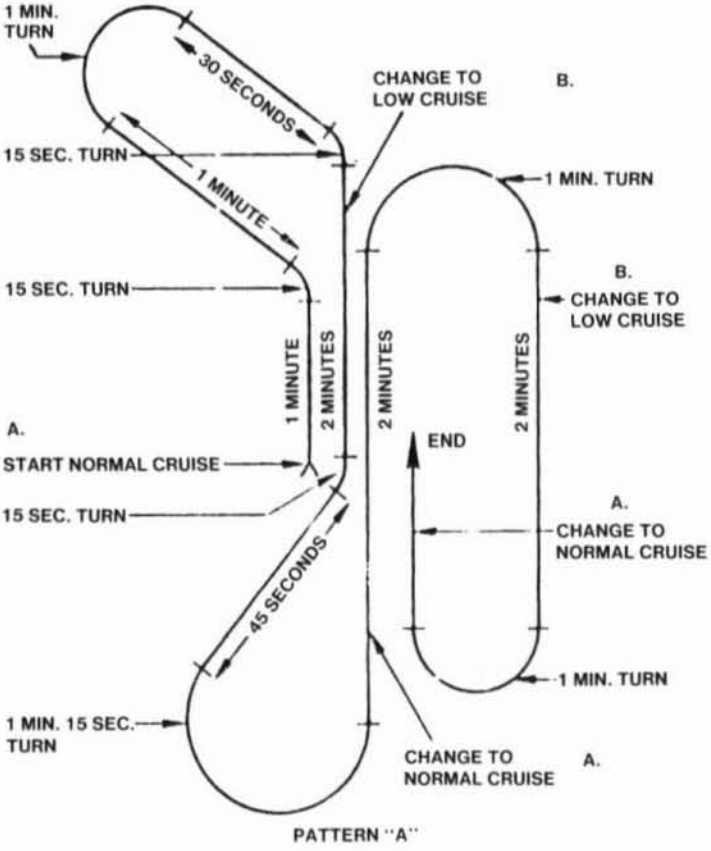
AIR MAIL FROM LONDON

Peter London, Flight Training Specialist

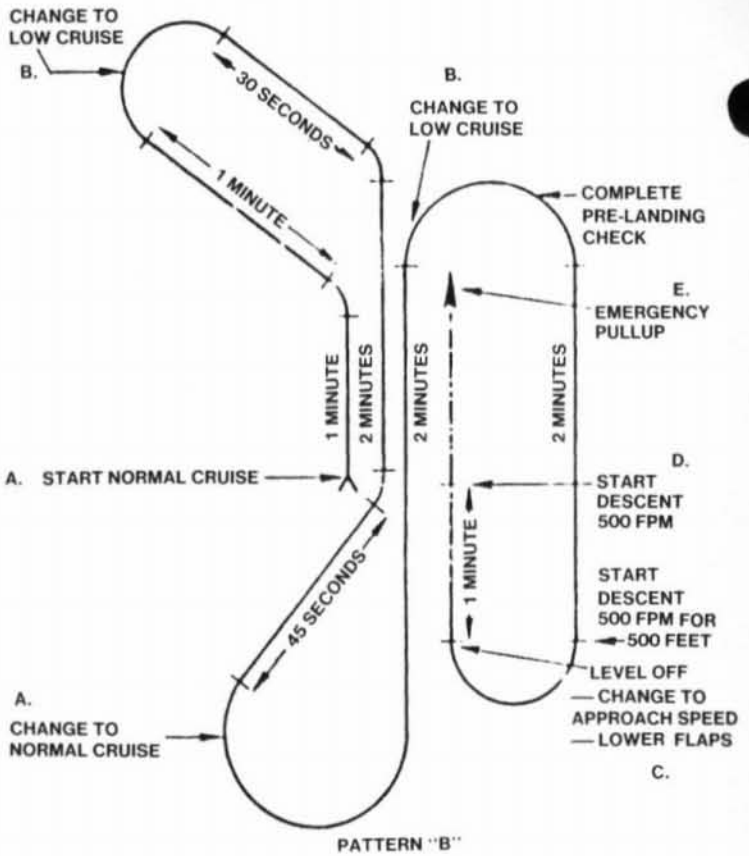
Last month we discussed the importance of foundation skills: that the key to reacting in a competent manner to various aspects of flight, including emergencies and irregularities is aircraft control, that our ability to set a predetermined airplane attitude rests with instilling a positive attitude or outlook for ourself, knowing that recurrent training on a continuing basis can and will expand our proficiency in procedure that heretofore was found limiting.

The more you can do to reduce the mechanics of your airplane's control (instrument crosscheck, instrument interpretation, pitch control, bank control, and power control) to a learned response out of habit without deliberate thought the more time you will make available to concentrate on the up-coming procedure. Improved pilot technique in aircraft control will develop from continued practice. Although I recommend supervised practice with an instructor, a pilot friend can act as a safety pilot during your practice with a view limiting device. What's important here is that you take the initiative to maintain and improve your skill in aircraft control.

Following are two practice patterns that you will find helpful in refining your pilot technique in pitch, bank, and power control.



PATTERN "A"



PATTERN "B"

During your practice you must define five areas of performance:

A. **NORMAL CRUISE** is the steady condition established for the enroute phase of flight. Normally this requires power set at 23"Hg & 2300 RPM (below 5,000'), gear-up, flaps-up, and a pitch reference on the attitude indicator of 0° to equal approximately 155 KIAS.

AREA OF PERFORMANCE	KIAS	MP	R/M	GEAR	FLAPS	PITCH	WHERE
A. NORMAL CRUISE	155	23"	2300	UP	UP	0°	ENROUTE

B. **LOW CRUISE** is a steady level flight condition established for the terminal area's "initial approach segment" initiated upon 1) crossing the first initial approach fix (IAF), 2) in the case of radar vectors, to achieve final approach course alignment — at the beginning of that radar vector, or 3) in either case this condition should be established when reaching a point 10 nautical air miles from the final approach fix (FAF). Normally this requires power set at 18"Hg & 2300 RPM, gear-up, flaps-up, and an attitude of 0° to equal approximately 130 KIAS.

AREA OF PERFORMANCE	KIAS	MP	R/M	GEAR	FLAPS	PITCH	WHERE
B. LOW CRUISE	130	18"	2300	UP	UP	0°	IAF, RV, or 10 nm

C. **APPROACH LEVEL** is a steady level flight conditon established for the terminal area's intermediate segment" initiated upon 1) completion of the procedure turn inbound, 2) completion of the turn onto the final approach course during a radar vector, or 3) in either case this condition should be established when reaching a point 3 to 5 nautical air miles from the FAF. Normally

this requires no change in power (18"Hg & 2300 RPM), gear-up, however flaps are extended to the approach or 15° setting, with an attitude of 0° to equal approximately 110 KIAS.

AREA OF PERFORMANCE	KIAS	MP	R/M	GEAR	FLAPS	PITCH	WHERE
C. APPROACH LEVEL	110	18"	2300	UP	15°	0°	Interm. Seg RV to Final Crs. or 3-5 nm

D. **APPROACH DESCENT** is a steady state descent established for the "final approach segment" initiated with **gear extension** 1) for precision approaches, upon intercept of the glide slope, or 2) for non-precision approaches, upon crossing the FAF. Normally this requires no change in power (18"Hg & 2300 RPM) or flap setting (15°); however, gear extension combined with a pitch decrease to approximately -3° is necessary to maintain airspeed at 110 KIAS. This condition will allow for a descent rate of approximately 500'FPM.

AREA OF PERFORMANCE	KIAS	MP	R/M	GEAR	FLAPS	PITCH	WHERE
D. APPROACH DESCENT	110	18"	2300	DOWN	15°	-3°	Glide Slope, or FAF

E. **EMERGENCY PULLUP or MISSED APPROACH CLIMB** is a steady state climb established for the "missed approach segment" initiated upon reaching the DH or MAP when it is determined that a visual transition for a normal approach to a landing cannot be made. Normally this requires a "maximum continuous" power setting at your airplane's "best rate of climb" (Vy) airspeed. This transition must be smooth and calculated with a gradual pitch increase to between 7° & 10° as referenced on the attitude indicator combined with gear and flap retraction.

AREA OF PERFORMANCE	KIAS	MP	R/M	GEAR	FLAPS	PITCH	WHERE
E. EMGR. PULLUP or MISSED APPROACH CLB.	Vy	Full	2700	UP	UP	+7° to +10°	DH/MAP

The configurations and airspeeds provided are consistent with late model Bonanzas equipped with the I0-520 powerplant. To ensure that your airplane's operating limitations are not exceeded, make reference to your operator's handbook.

It is important to note that changes to your Bonanza's manifold pressure will have a predictable affect on its performance. Simply stated:

1" HG change is equivalent to a change of 100"FPM for a constant airspeed.

You can use this equality to your advantage when operating in the power region of "normal command" during future trips. However, you should practice this relationship first to gain proficiency.

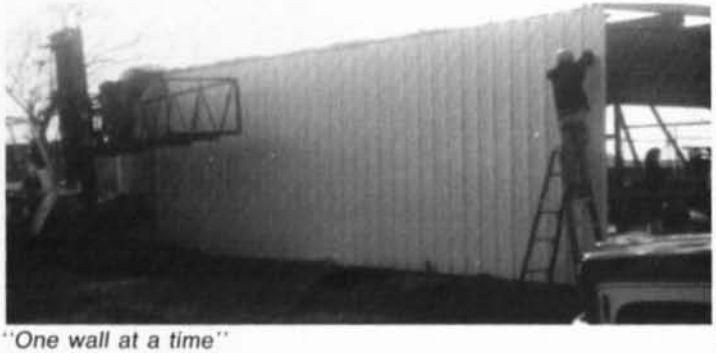
Each of the areas of performance described here are identified by capital letter and correspond to the capital letters in Pattern's "A" and "B".

Remember, that the brackets for airspeed, altitude, heading, and time represent the standards for performance expected. As the pilot/operator you must firmly set these guidelines. your performance should be evaluated on your ability to maintain airspeed within ±10 Kts and vertical rate within ±200'FPM of that desired; level-offs and rollouts should be completed within ±100' and ±10° of the altitude and heading desired. Additional guidelines for practice of Patterns "A" & "B" are: (1) perform first with all available instruments, then on partial panel, (2) After recovery from turns, allow sufficient time for the compass card to stop oscillating, then note the heading and correct if necessary, (3) the final descent (Pattern "B") is made to a minimum altitude, or until the time expires, whichever comes first, and (4) the emergency pull-up or missed approach climb is made as a normal go-around procedure, climbing to the original altitude.

To get started — take hold of Pattern "A" first and clearly think outs its procedure. Ensure that your preflight preparation and planning is adequate. And, thoroughly brief your safety pilot of the procedure, practice area boundaries, and his/her responsibilities.

During your practice remain alert for other aircraft and obstructions. Information concerning collision avoidance can be found in VFR EXAM-O-GRAM No. 22 & No. 48.

Next month's article will be concerned with completing a checklist for visual or instrument flight operations. Checklist forms will be illustrated that are examples of good, safe preflight preparation and planning. For study material, reference Instrument Flying Handbook AC 61-27B, Chapter 12: "Flight Planning;" Part 91.5 FAR, "Preflight Action;" AIM Basic Flight Information and ATC Procedures, Section 5, "Preflight;" IFR EXAM-O-GRAM No. 19, No. 41; and VFR EXAM-O-GRAM No. 4, No. 5, No. 6.



"One wall at a time"

Facing east, towards FlightSafety Cessna.

HEADQUARTERS CONSTRUCTION STARTS AGAIN

Brought to a halt by the horrible winter weather, construction is again underway on the Society's headquarters and the Foundation's library building. The slab is poured, the steel is on site, and the shell should be erected by the end of March. The Society can use each member's help with this project. Having our own facilities and library related specifically to Bonanzas will benefit every member.

Donate to the building fund by utilizing the contributor's form in the Ad Mart section.

ICING CONDITIONS

MORE ON ICING

Dear ABS:

Regarding the letter **ON ICE** by Charles Leoni of Miami Beach, Florida in the January Newsletter, in which he describes a stall from icing conditions at 12,000 feet:

I am writing because I had an identical experience but under much more favorable conditions, and I would like to share it with other readers as well as Mr. Leoni.

The culprit in this particular case is the Altitude Hold on the autopilot. No mention was made by Mr. Leoni of the indicated trim position on the indicator, but my guess is it was at 10 or 12 degrees of UP trim just before the stall. I strongly urge every pilot who has altitude hold to go through this wierd experience at a safe altitude. Get everything set up straight and level, and engage the autopilot and altitude hold. Then, gradually reduce the power in small amounts, and wait. When you finally reach the point that the airplane can no longer hold the assigned altitude with the available power, you will fall "behind the power curve".

The autopilot will start to rapidly roll in UP trim in its futile attempt to maintain assigned attitude by increasing pitch. The rate at which this takes place will amaze you, especially if you keep your hands off the controls, resulting in a very nose-high pitch, rapidly diminishing speed and the eventual stall.

Normal recovery requires DISENGAGING the altitude hold, or the entire autopilot, adding sufficient power and lowering the nose while re-trimming to the correct position as smoothly as practical. My experience occured during my orientation to my then-new A-36 while in a practice approach with wheels down. Fortunately, I had a more-experienced CFII Bonanza pilot on board in the right seat and he let the condition proceed so I would have the experience. I will never forget it. Fortunately he had me practicing simulated landings and missed approaches several thousand feet above the ground.

Needless to say, I now disengage the autopilot altitude hold upon reaching the initial approach fix, and hand fly all approaches from the final approach fix.

Three other items Mr. Leoni did not mention:

1) Was he at full power when the speed started to decay?

2) Did he have pitot heat on?

3) Did he have time to check the trim position indicator?

I have found that due to its location on the Bonanza the trim indicator is often overlooked when scanning the instruments, but it can be extremely important as a clue to what the autopilot altitude hold is doing to maintain assigned altitude, especially in icing conditions, and as a back-up indicator to the artificial horizon.

If you have not experienced an "autopilot stall", I urge you to try one.

Dr. Erwin Jay
ABS #12402

MORE AUTOPILOT REPORTS

Dear ABS:

In response to Dr. Schilb's request for an unbiased comparison of autopilots, the following —

I fly a V-35B, and after looking at all the options — Mitchell, Pathfinder, Brittain, King — I decided to try the new S-TEC System 60 Autopilot. This is a new company but I understand composed of experienced people who were associated with Mitchell and had a better idea.

The System-60 is modular, you can start with a wing leveler and step by step upgrade to a flight director. Comparatively the S-TEC is very smooth having 3 levels of sensitivity. Station passage is nearly imperceptible.

S-TEC provides a 12-month warranty, too. If a part fails or isn't right, the unit is exchanged without question and done right now without delay. What's more, parts are available if needed.

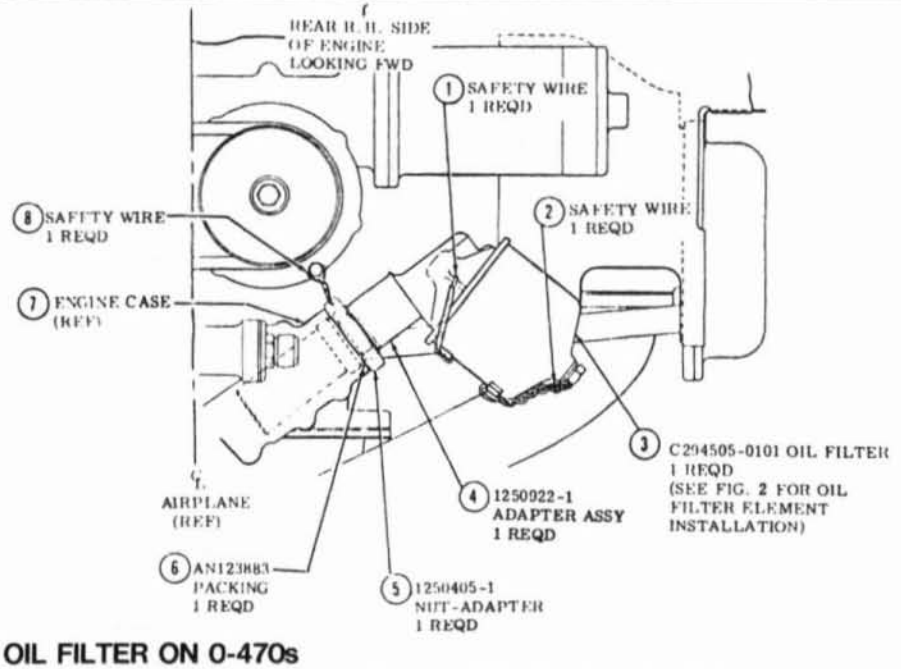
The price is about $1,000 less than the competition for a single axis autopilot with heading select, VOR tracking to-and-from the station, localizer coupling and back-course reverse. To watch an S-TEC figure out how to intercept a localizer is truly amazing, better than human.

I'm sold, and I've had good luck in the past with Mitchell and Brittain; but I've found something better.

Ned Tanner
ABS #8230

COPIES OF PAPERWORK NEEDED

Because there seems to be so many different sets of paperwork in regards to the original Flight Extender tip tanks, it is asked that any member who has had Flight Extender tip tanks installed prior to 1971 send a copy of the paperwork (337 Form, Flight Manual Supplement, Installation Drawings, etc.). These will be used to assist members and become part of the Society's Technical Library.


REAR R.H. SIDE OF ENGINE LOOKING FWD
1 SAFETY WIRE 1 REQD
2 SAFETY WIRE 1 REQD
3 C294505-0101 OIL FILTER 1 REQD (SEE FIG. 2 FOR OIL FILTER ELEMENT INSTALLATION)
4 1250922-1 ADAPTER ASSY 1 REQD
5 1250405-1 NUT-ADAPTER 1 REQD
6 AN123883 PACKING 1 REQD
7 ENGINE CASE (REF)
8 SAFETY WIRE 1 REQD
℄ AIRPLANE (REF)

OIL FILTER ON 0-470s

Dear ABS:

In the January Newsletter, the info about the full flow oil filters for the "O" series caught my eye. On my "H" model, which has the 0-470-GCI (converted injected) engine, I have installed Cessna Kit AK210-61L using a 337 form. It is a Cessna kit, made for use on the 205, 206, 210 series of planes in lieu of the oil screen. What I like about it is that it does not necessitate any additional plumbing. The filter attaches to an "arm" which is installed in the location from which the oil screen has been removed. The filter is easily accessible for changing. It uses a Champion CH-48110 screw on filter.

Barrie C. Hiern, Sr.
ABS #1632